CURRICULUM CORE KNOWLEDGE PLAN

SUBJECT: Design Technology YEAR GROUP: 9 DATE: 2024/2025

Design Technology KS3 National Curriculum

Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world.

Students have one hour of Design Technology a week. The aim of the curriculum is to give students an introduction to the variety of knowledge, skills and understanding in order to design and make high qualilty protoypes using the iterative design process. Students will gain experience in the importance of gathering primary and secondary research, anaylsing and evaluating existing products using ACCESS FM and be able to use a vairiety of design techniques to mark out, measure, join and combind a variety of materials and components successfully. Students will understand the properties of various materials and will enhance their key words so they are confident in answering questions both written and orally using subject specific vocabulary.

The iterative design process will be aparant throughout the year with constant evaluation and development, celebrating resiliance. Throughout the course of year 9, students will refine the engineering drawing skills that they developed in year 7 and 8 be successful in producing perspective drawings independently to create a range of design ideas. Students will learn how to draw successfully in orthographic and isometric projection and understand this style of engineeering drawing. Throughout the course of the Autumn term students will develop accuracy when marking out and measuring and will understand the importance of doing this during mass and batch production. Students will enhance their primary and secondary research techniques to gather ideas that will enable them to produce design ideas. They will look at the meaning of biomimicry and products that have been inspired by the natural world. Students will use paper and card to make mechanisms that follow the theme of biomimcry and will work as part of a team to produce a pop up book inspired by the landscape of Walney. Students will use their initial design ideas and prototypes inspired by biomimicry to develop there ideas into usuable jewellery/ memory box, pewter cast jewellery and picture frame. Students will develop their knowledge of different joints to join natural timber, they will develop accuracy when marking out and cutting to produce a professional end product that shows precision.

Term and unit	Core knowledge	Core Skills	Core Vocabulary	Revisiting prior knowledge	Links to Walney Ways & Employability skills/Careers
Autumn 1 Isometric and Orthographic projection	Design Identify and solve their own design problems and understand how to reformulate problems given to them Use a variety of approaches to generate creative ideas and avoid stereotypical responses. Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, digital presentations and computer-based tools Evaluate Understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities	Students will use and apply subject specific vocabulary when annotating and analysing their own work and the work of others. Students will develop their understanding of subject specific key words. Students will recap the engineering drawing techniques (one- and two-point perspective) covered in year 7 and 8 and develop their accuracy, precision and measuring to use the drawing boards and equipment competently to produce accurate orthographic and isometric drawings.	Isometric Orthographic Orthogonal Transverse Horizontal Vertical Parallel Set Square T Square	Developing engineering drawing skills from year 7 and 8 perspective drawing and using equipment accurately and precisely. Embed CAD skills from year 7 and 8 to produce 3D designs on sketch up to create realistic intentions.	Walney Ways Wider thinking Self motivated Communicative Aspirational Curious Resiliant Employability. Customer/ client service and commercial business awareness. Organisation, planning and timemanagement. Self awareness Problem solving

	of designers, engineers and technologists Technical knowledge Understand and use the properties of materials and the performance of structural elements to achieve functioning solutions				
Autumn 2 Mechanisms What is biomimicry?	Design Identify and solve their own design problems and understand how to reformulate problems given to them Make Select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture	Students will develop their initial design ideas and model making skills, the iterative design process will be apparent throughout the whole design process in year 9 and show constant design, evaluation and improvement. Students will work as part of a team to problem solve and create an idea for their pop-up book. Each member of the group will create a different page design with different working mechanisms and movements.	Mechanisms, Biomimicry, Computer Aided Manufactring, Computer Aided Design, CAMS	Develop understanding of mechanisms from year 7 and year 8 and the properties of papers and boards.	Walney Ways Wider thinking Self motivated Communicative Aspirational Curious Resiliant Employability. Customer/ client service and commercial business awareness.

	Evaluate Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups Technical knowledge Understand and use the properties of materials and the performance of structural elements to achieve functioning solutions	Students will develop primary research techniques around the theme biomimicry. Students will use Aesthetic, cost, customer, environment, size, safty, function and material to analyse their work in relation to the brief and specification. Students respond to a working design brief that has been set by a client. Students will create a range of design ideas using sketching techniques using their research, all designs will be annotated with key words and analysed. Students will research and model different mechanisms using paper and board to create movement.			Organisation, planning and timemanagement. Self awareness Problem solving Team Work
Spring 1	Design	Students will develop an understanding about the machinery used during the making process.	Joints Finger joint Butt joint Natural Timber	Develop marking out and measuring techniques	Walney Ways Wider thinking Self motivated Communicative

Joints and jewellery box	Use research and exploration, such as the study of different cultures, to identify and understand user needs Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools Make Select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties Evaluate investigate new and emerging technologies	To develop an understanding of natural and man made board and it's properties. To manufacture a range of different joint (differentiated) – butt and finger joint. To select and use tools and machinery effectively and safely. To use CAD and CAM to generate and produce design ideas to meet a design brief and specification.	Man Made Board MDF Plywood Chip Board CAD CAM Tenon Saw Coping Saw Engineers Square Accurate Vice Bench Hook Disc Sander File Cross Filling Fret Saw Marking out Measuring Jig Production methods	developed in year 7 and 8. Develop knowledge and properties of materials developed in year 7 and 8. Develop accuracy of both hand and machine tools to create a final outcome. To develop design ideas implemented in KS2 and KS3 using perspective drawing techniques to create realistic and annotated intentions. To evaluate design ideas- developed from year 7 and 8.	Aspirational Curious Resiliant Employability. Customer/ client service and commercial business awareness. Organisation, planning and timemanagement. Self awareness Problem solving

	test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists Technical knowledge understand and use the properties of materials and the performance of structural elements to achieve functioning solutions				
Spring 2 Jewellery design Pewter casting	Design Identify and solve their own	To refine cutting techques To enhance 2D design skills	Pewter Casting Mould Metals	Links to year 8 keyring project, developing CAD and design skills.	Walney Ways Wider thinking Self motivated Communicative Aspirational

	design problems and understand how to reformulate problems given to them Develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations . Use a variety of approachesto generate creative ideas and avoid stereotypical responses Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, digital presentations and CAD. Make Select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture	To develop an understanding of the processes and outcomes of the lazer cutter. Understand the properties of metals and alloys Understand the processes involved in casting pewter Understand how to cast pewter safely and effectively Understand finishing through wastage; cutting, drilling, filing and sanding Understand how to use of polishing to enhance finishes Understand how to review their learning and progress To develop skills to write and record the processes to produce a complete and accurate production plan.	Design Brief Specification Client File Pillar Drill CAD CAM	Links to KS3 CAM lessons using the laser cutter. Links to Refining and evaluating in year 7 and 8. Developing research skills developed in year 7 and 8.	Curious Resiliant Employability. Customer/ client service and commercial business awareness. Organisation, planning and timemanagement. Self awareness Problem solving

	Select from and use a wider, more complex range of materials and components taking into account their properties Evaluate Investigate new and emerging technologies Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups. Understand developments in Design and Technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists Technical knowledge Understand and use the properties of materials and the performance of				

	structural elements to achieve functioning solutions				
Summer Term Picture frame/ memory frame	Make Select from and use specialist tools, techniques, processes, equipment and machinery precisely. Technical knowledge Understand and use the properties of materials and the performance of structural elements to achieve functioning solutions.	To develop skills to use jigs and specialist tools and equipment. To develop accuracy when measuring, marking out and cutting. To develop a further understanding of joints and their specific uses to make a working product- mitre joint To evaluate and modify during the making process To develop skills to write and record the processes to produce a complete and accurate production plan.	Mitre Joint Butt joint Mitre Block Marking out Measuring Accurate Design Brief Design Specification Production plan Evaluation Tenon saw Vice	Links to year 7 and year 8 pencil holder, boat and jewellery box project complete din year 9 to develop design, making and modelling, use of tools and equipment, properties of timbers and production methods.	Walney Ways Wider thinking Self motivated Communicative Aspirational Curious Resiliant Employability. Customer/ client service and commercial business awareness. Organisation, planning and timemanagement. Self awareness Problem solving

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